VALUATION OF ILLINOIS OIL PRODUCING PROPERTIES FOR TAX ASSESSMENT

BY

TRUMAN GLENN TRACY

A. B., University of Illinois, 1939

A. M., University of Virginia, 1940

AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN ECONOMICS
IN THE GRADUATE SCHOOL OF THE
UNIVERSITY OF ILLINOIS, 1947

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Illinois has a general property tax, and most of the property is locally assessed. The State Department of Revenue, however, has the power to adopt rules "for the guidance of local assessment officers relative to the assessment of property for taxation."[1] In 1933 a manual for the instruction of assessors was issued, and it has been revised and reissued at intervals since then. One chapter of this manual has been devoted to the "Assessment of oil and mining rights and related personal property."[2] In this chapter a procedure for valuing oil properties was recommended which followed very closely the method used in the early Illinois field and in other oil producing states. This method of assessment attempts to approximate the unknown capital value through applying varying multiples to a known rate of average daily production.

As our local assessors have neither the time nor the training to make detailed engineering appraisals on each individual lease, and as the governmental units will not bear the almost prohibitive cost of having them made by registered petroleum engineers, Illinois has necessarily resorted to this simple type of blanket formula. This method is not as arbitrary as it might appear, because it is also used as a quick "rule of thumb" method for valuation by oil men, and, to the extent that property is bought and sold on this basis, it actually determines market value.

The actual values that were recommended in the 1944

[1] *The Revenue Act of 1939, As Amended*, Section 131.

[2] *Illinois Assessors' Manual, 1944*, Department of Revenue, Railroad and Property Tax Division, 1944, Chapter 10.

manual were as follows:[3]

First year—$200 for each barrel of average daily production.
Second year—$400 for each barrel of average daily production.
Third year—$600 for each barrel of average daily production.
Fourth year and after (settled production)—$800 for each barrel of average daily production.

In an attempt to bring this earlier formula into line with current cost and market conditions in the industry, an analytical study of Illinois oil producing properties was made for the Department of Revenue in April, 1946.[4] Engineering appraisals were made of 93 leases, and the results were reduced to a well valuation series. Despite the considerable dispersion present in the individual values, the median became the basis for a new set of values recommended by the Property Tax Division of the Department of Revenue, as follows:

The following are the recommended 1946 full values for the working interests in oil wells, inclusive of personalty, which should be separately assessed. These values include the leasehold, pumps, stock tanks, lead lines, casing, engines used for lifting, etc., but do not include oil stored in tanks and re-pressuring and gas plants:

1. Any well producing more than 4 bbls. per day, irrespective of age: *$800 per bbl. March daily average production.*

2. Any well producing 4 or fewer bbls. per day and less than 25 years old: *$1,000 Flat.*

3. Any well producing 4 or fewer bbls. per day and more than 25 years old: *$500 per bbl. March daily average pro-*

[3]*Ibid.*, p. 125.

[4]By Clarel B. Mapes, Civil Engineer and General Secretary of the Mid-Continent Oil & Gas Association of Tulsa, Oklahoma.

duction but not less than $150.

Recommended 1946 full value for oil well royalty interests: *$150 per bbl. March daily average production of working interest (lessor).*

These recommended values retain the merit of extreme simplicity and definiteness. If strictly followed, they would virtually eliminate the human factor involved in the individual judgment of the assessor. To the extent that known are substituted for unknown factors, the system is certainly an improvement over the arbitrary guess of the assessor. But oil properties are not standardized, and it would not be equitable to value them all impartially by this same simple formula.

Without destroying its essential simplicity, it is possible to obtain a greater degree of equity by introducing into the formula a limited number of the variables involved in comparing oil properties.[5] The basic factor in the valuation should continue to be the daily average production per well, but a refinement of the simple formula through the introduction of some of the variables would permit allowances and adjustments to be made for some of the other important differences between the producing properties.

In this study, these variables are examined. Some of them had to be eliminated because the necessary information would not be available to the local officials, or because their introduction would too greatly complicate the formula. Age,

[5]A partial list of some of the more important variables would include differences in: age (whether in a stage of flush, intermediate, settled, or stripper production, and if flush, whether the wells are flowing or are on the pump), initial production, depth, drilling hazards, number of producing zones, thickness of producing zones, nature of the producing zones (sand or lime, the porosity, the permeability, the amount of connate water, etc.), position on the structure, the degree of natural water drive, the gas-oil ratio, secondary recovery possibilities, well spacing, degree of unitization, the quality of the oil, the price of the oil, the accessibility to pipe-lines and markets, the varying types of operating organizations, the provisions for royalties and oil payments, lease troubles, and the salvage value.

depth, nature of the pay, and volume of production are retained and incorporated into the formula. *Age* is important because a relationship must be established between the volume of production and the volume of recoverable oil remaining in the ground. As that relationship is not constant over the life of the well, compensating adjustments must be made in the value ascribed to each barrel of production at different ages of the well. *Depth* is important as a representative cost factor for both the development costs and for the operating costs. The *nature of the pay* is important because of the much more rapid decline in the production of a typical lime well as compared to a typical sand well. The *volume of production* is particularly important as production declines toward the stripper level and the operating cost per barrel becomes increasingly significant.

The choice of the variables and their general weight in the make-up of the formula were the results of a deductive study. An inductive study was then made to test the particular values chosen. Use was made of the detailed study made for the Department of Revenue a year ago. Ten leases were taken at random, and the average value per well was computed for each lease for each of the first eight years 1) by analytical or engineering appraisal, and 2) by application of the proposed formula to the March daily average production. The figures for the individual leases were then added vertically and averaged to get an average value of the average value per well of the ten leases by the two methods. When these averages were plotted, the resulting curves showed a close correlation. If the values in the formula were correct, a larger sample should have the effect of making the correlation even better. To determine this, the sample was doubled. The composite average for all twenty leases was plotted, and the fit was better for the larger sample. After other correlations were run between the two methods of appraisal and the indicated adjustments in the values made, the following refined formula was submitted to the Department of Revenue with the recommendation that it be used

in valuing Illinois oil producing properties for tax assessment:

Following are recommended full values for the working interests in oil wells, inclusive of personalty, which should be separately assessed. These values, however, do not include oil stored in tanks and re-pressuring and gas plants. The daily average barrels per well of the working interest only are used in computing the value per barrel:

PART 1

AGE	DEPTH TO TOP OF DEEPEST PRODUCING PAY					
	Less than 1500 ft		1500-2750 ft.		2750 ft. and over	
	Daily Av. bbls. Per Well	Value Per Bbl.	Daily Av. bbls. Per Well	Value Per Bbl.	Daily Av. bbls. Per Well	Value Per Bbl.
Flush (1st 6 months)	.....	$600	.....	$600	.....	$400
Intermediate (7th-24th mos.)	.....	$800	.....	$800	.....	$800
Settled (3rd year and after)	8 and above	$1000	10 and above	$1000	12 and above	$1000
	5 to 8	800	6 to 10	800	8 to 12	800
	2 to 5	600	3 to 6	600	4 to 8	600
Stripper (marginal producers)	less than 2	see part 2	less than 3	see part 2	less than 4	see part 2

PART 2

For those wells in the stripper class:

a. Drilled before Jan. 1, 1937—$500 per bbl. but not less than $150.

b. Drilled since Jan. 1, 1937, and less than 2750 feet deep —flat $1000 per well.

c. Drilled since Jan. 1, 1937, and 2750 feet and over in depth—flat $1500 per well.

PART 3

Recommended full value for oil well royalty interests per bbl. daily average production of working interest:

a. $100 per bbl. for flush production.

b. $150 per bbl. for intermediate production.

c. $200 per bbl. for all settled production.

d. $100 per bbl. for all stripper production.

Representatives from most of the major oil companies operating in Illinois were present at a meeting held by the Department of Revenue in Chicago on August 25, 1947, and they unanimously agreed to accept this formula for valuing their Illinois oil producing properties for property tax assessment. An exception may have to be made of those properties which are producing oil as a result of secondary recovery operations, and the values in the formula will have to be adjusted from time to time in the future to conform with changing market and cost conditions.

VITA

Truman Glenn Tracy was born in Kewanee, Illinois, on June 18, 1918. He was graduated from the Geneseo Township High School in 1936. For the next three years he attended the University of Illinois on a county exam scholarship, receiving the A. B. degree in 1939. During the next year he attended the University of Virginia on a DuPont service fellowship, receiving the M. A. degree in 1940. Returning to the University of Illinois as an Assistant in Economics, he completed one additional year of study before enlisting in the United States Navy. After four years of service as a naval officer, three of them spent abroad, he returned to the University of Illinois and resumed his study toward the doctor of philosophy degree in economics. He is a member of Phi Beta Kappa, Phi Eta Sigma, Alpha Kappa Psi, and Zeta Psi fraternities, is married, and has two children.